

# Modern Concepts of Cardiovascular Disease

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## HEART DISEASE AND PREGNANCY

Having first made a definite diagnosis of the presence of cardiac disease the next important step is to make a prognosis as to how the patient will stand the extra strain upon the heart which will come during pregnancy and the much more severe acute strain which will come during labor. It seems to be true that, provided serious cardiac insufficiency does not develop, there will be no permanent damage to the mother's heart from having a child. In determining the likelihood of severe cardiac insufficiency developing, we are to be guided by the cardiac functional ability much more than by the pathological diagnosis. Mitral stenosis has an unwarranted reputation as a serious cardiac complication and so has the presence of considerable cardiac enlargement. Neither of these conditions is incompatible with satisfactory cardiac function.

To determine this functional ability we must inquire the amount of walking and of stair climbing which can be done without causing undue shortness of breath. Allowance must be made for the limited ability to exercise which is found in many normal women and a further allowance must be made for the diminished ability to exercise which comes normally with pregnancy. We must know the amount of exercise to be expected of a woman of the type under consideration at the particular state of pregnancy when she presents herself for examination. The development of fatigue on effort is not so important a symptom for rating cardiac functional ability as is the development of shortness of breath. At times the patient will develop fatigue so easily that she does not exert herself enough to develop shortness of breath. This makes it difficult to estimate the cardiac reserve from the history. Sometimes the patient will underrate her discomfort and sometimes will overrate it.

In such doubtful cases it is very helpful to use a test exercise as a check upon the patient's stated

ability to exercise. Stair climbing is satisfactory from the point of view of exercise but usually impracticable and so it has been found that swinging a dumbbell from between the legs to over the head with the elbows straight serves satisfactorily. A patient may swing an eight-pound bell twenty times or a five-pound bell twenty-five times and immediately after this exercise, she should be observed for the degree of tachycardia, the degree of objective dyspnea and the duration of these effects of the exercise. We must know how much reaction to expect from a normal pregnant woman after this effort and must compare this expected reaction with the reaction observed. Moderate tachycardia and dyspnea subsiding in one or two minutes is normal. Marked tachycardia and dyspnea indicate a moderate or marked reduction of cardiac reserve, depending upon the degree and duration of the disturbance. Inability to finish on account of dyspnea or palpitation indicates a marked reduction of cardiac reserve. If the patient is unable to finish the exercise on account of fatigue or if she stops before the exercise is finished and does not show marked tachycardia and dyspnea, there is probably something other than cardiac insufficiency causing this cessation of the exercise.

Patients who say that they are able to walk and to climb stairs with no more restriction than would be expected and who show a normal reaction to a test exercise are not to be feared from the point of view of their cardiac functional ability. These fall into Class I of the generally adopted rating of cardiac functional capacity. Those who give a history of unusual shortness of breath on walking or on climbing stairs and who develop unusual tachycardia and dyspnea after an exercise test have a limited cardiac reserve. These fall into Class 2a or 2b of cardiac functional capacity depending upon

whether their reaction is slightly or markedly increased.

The signs which appear during pregnancy to indicate a diminution of the cardiac reserve are entirely concerned with the cardiac functional capacity as it has been discussed. If we wait for a rise in the pulse or respiratory rate or for the rales of pulmonary congestion, we have waited too long. Differences in the reaction to exercise can be demonstrated in patients who do not show any of these features.

Although the development of shortness of breath on effort should be our guiding feature during pregnancy, yet during labor it cannot be used on account of the pains of labor and the patient's disturbed mental condition. At this time we must rely upon counting the pulse and the respiration and observe dyspnea in the periods between pains. Both the pulse and the respiration are normally slightly increased during labor, especially in the apprehensive or neurotic patient. If in the presence of heart disease the pulse rises to 110 and the respiration to 25, the situation is a grave one and need for relief of the heart is immediate. It is advisable, therefore, to keep a record of the pulse and the respiration during labor, counting at first every thirty minutes and later every twenty minutes. The pulmonary bases should also be frequently examined for the presence of rales but the appearance of rales should not be considered as something to be waited for, rather to be avoided. The pulse and respiration will usually give warning some time before rales appear.

If a patient is found either before or during pregnancy to have slight or no restriction of her ability to exercise, she may be safely allowed to progress under competent medical observation, no matter what her valvular lesion may be. Patients with no restriction of their cardiac functional capacity (Class 1) can be expected to go through pregnancy and labor with no sign of serious cardiac insufficiency. Some of the patients with slight restriction of their cardiac functional capacity (Class 2a) will become more marked in their restriction (Class 2b) during the later months of pregnancy. At this time they should be managed as will be described for such patients. A Class 2a patient may be allowed to go into labor if careful pulse and respiration counts are taken as described and only rarely will the pulse and respiration reach dangerous figures. In those cases where this does occur, the labor should be accelerated by whatever obstetrical procedures seem most appropriate at the

time. Class 2a patients will rarely, if ever, develop serious cardiac failure.

If a patient is found before or during pregnancy to have a moderate or marked restriction of her ability to exercise (Class 2b) it is a serious question as to whether or not the pregnancy should be interrupted. If she still desires to take the risk for the sake of the child, there is then another important question as to whether she should be allowed to go into labor. It is true that such patients often go through labor successfully, especially if they are multipara, but because we are so unable to predict the degree of strain which will occur during a given labor and because the appearance of severe heart failure during labor is such a dangerous thing for the mother, it does not seem proper to take the chance of its occurrence. If such a patient must have a child, it should be by the abdominal route.

These patients are in definite need of cardiac treatment during pregnancy. In the milder cases this may merely consist of the proper regulation of physical activity so as to avoid doing things which produce fatigue or shortness of breath, but in the more severe cases and always after the middle of the eighth month, the administration of digitalis will be helpful. It should be given in the manner usual for ambulatory patients, starting with six grains a day for two or three days and continuing with four grains a day until therapeutic or mild toxic effects appear. Digitalis poisoning has a tendency to induce labor so it should be avoided if possible especially before the child is viable. In severe cases physical activity must be greatly reduced during the eighth and ninth months. Rest in bed for most of the time may be needed to keep the pulse and respiration from becoming rapid. These are dangerous cases and should not be allowed to go into labor for the risk is too great. They should be delivered by abdominal section.

Intrauterine manipulations are very dangerous in these cardiac patients. The resultant shock may give rise to a death which otherwise could have been avoided. There is also considerable danger in the administration of gas for the induction of anaesthesia. It interferes sufficiently with the oxygen carrying capacity of the blood to put an important strain on an already weakened heart. If anaesthesia is necessary, ether is quite satisfactory but should be preceded by chloroform to accelerate the preliminary stages. Local anaesthesia has been found quite satisfactory for the Caesarean operation and appears to be well borne by cardiac patients if they are temperamentally fitted for it.

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